ABSTRACT

BACKGROUND: The identification of gender of an unknown person is of primary importance in forensic medicine. The uniqueness and interindividual variation in size, shape, symmetry, permanence of anatomical landmarks provides scientific information in forensic anthropology. The paranasal sinuses are complex anatomical structures with a significant inter-individual variation hence they are useful tools for gender dimorphism.

AIMS AND OBJECTIVES:

- To compare maxillary and frontal sinus dimensions and to assess its reliability and accuracy for gender determination using CT scan
- To analyse the data and determine if any gender differences in maxillary and frontal sinus that can be applied as an aid in forensic investigation

MATERIALS AND METHODS: CT images of 50 subjects(25 males and 25 females) aged between 18-65 years who reported at Vivekanandha Medical care hospital were included in the study. The greatest dimensions of maxillary and frontal sinus of different parameters was analysed and subjected to multiple regression analysis and their accuracy was determined. ANOVA test was done to compare with age subgroups. The degree of reliability was tested using a two-way mixed intra-class correlation coefficient.

RESULTS: The mean value of anteroposterior diameter of right maxillary sinus and total distance across maxillary sinus showed significant difference. Similarly, when frontal sinus dimensions were correlated, the anterior wall thickness and anteroposterior length showed statistical significance (p value <0.05) with higher values in males when compared to females. ANOVA test done to compare with age subgroups stated that the right and left mediolateral width and right anteroposterior diameter of maxillary sinus showed significant p value (<0.05).

The overall accuracy of maxillary and frontal sinus was 64.0% and 65.9% respectively for gender dimorphism.

CONCLUSION: The present study reports that maxillary and frontal sinus dimensions exhibits gender dimorphism. The accuracy rate was greater for frontal sinus when compared with maxillary sinus. Thus CT examination of maxillary and frontal sinus could be considered as an additional adjuvant aid for forensic identification.

KEY WORDS:

Forensic identification, CT scan, Gender dimorphism, Human skull, maxillary sinus, frontal sinus